



The Spotted Predatory Katydid
(*Chlorobalius leucoviridis*) female

METAMORPHOSIS AUSTRALIA

Magazine of the Butterfly & Other Invertebrates Club

ISSUE NO: 84



DATE: MARCH 2017

Price \$6.00

ISSN: 1839-9819
<http://www.boic.org.au>

PLANNING AND ORGANIZING COMMITTEE 2016

President:	Ross Kendall	07 3378 1187
Vice President:	Alisha Steward	07 3275 1186
Treasurer:	Rob MacSloy	07 3824 4348
Secretary:	Rob MacSloy (acting)	07 3824 4348
Magazine:	Daphne Bowden (daphne.bowden1@bigpond.com)	07 3396 6334
Publicity and Library:	Lois Hughes	07 3206 6229
Field Trip Co-ordinator:	Paul Klicin	0411 031 406
Committee Members:	John Moss Richard Zietek	07 3245 2997 07 3390 1950

PLANNING AND ORGANIZATION MEETINGS

A quarterly meeting is scheduled in order to plan club activities and the magazine.
See BOIC Programme.

CONTACT ADDRESS AND MEMBERSHIP DETAILS

PO Box 2113, Runcorn, Queensland 4113

Membership fees are \$30 for individuals, schools and organizations.

AIMS OF THE ORGANIZATION

- To establish a network of people growing butterfly host plants;
- To hold information meetings about invertebrates;
- To organize excursions around the theme of invertebrates e.g. butterflies, native bees, ants, dragonflies, beetles, freshwater habitats, and others;
- To promote the conservation of the invertebrate habitat;
- To promote the keeping of invertebrates as alternative pets;
- To promote research into invertebrates;
- To encourage the construction of invertebrate friendly habitats in urban areas.

MAGAZINE DEADLINES

If you wish to submit an item for publication the following deadlines apply:

March issue – February 1st June issue – May 1st

September issue – August 1st December issue – November 1st

All articles should be submitted directly to the Editor daphne.bowden1@bigpond.com

**ALL MATERIAL IN THIS MAGAZINE IS COPYRIGHT TO BOIC AND THE
AUTHORS, ARTISTS AND PHOTOGRAPHERS INVOLVED.**

COVER IMAGE

The Spotted Predatory Katydid (*Chlorobalius leucoviridis*) – Image by David Rentz



FROM THE PRESIDENT

Each quarter, when I read through this magazine, I am always impressed by the quality of the articles that Daphne has received and then woven into a good read. I am also impressed by the dedication of each author and by the fact that each one has contributed quite a lot on time and “effort” into the final submission. Thanks to all of you. At the risk of offending other authors, I would like to make a special mention of long-time friends of the club, Densey Clyne, Wesley Jenkinson and Kelvyn Dunn who have written a large number of reports over the years.

There are a number of trips/excursions planned over the coming months and I urge you to attend if you are in the area. Not only is there an opportunity to learn more about invertebrates and associated plants but there is the added bonus of meeting up with others members and sharing experiences with them. Thanks go to Paul Klicin for his enthusiastic coordination of these events.

You will have received notice of the club's Annual General Meeting with this edition of "Metamorphosis Australia". If you are "in range", please come along to IndigiScapes where again there will be the opportunity to meet with other members plus the added bonus of hearing Erica Siegel talk about Australia's solitary bees.

Best wishes *Ross*

IN THIS ISSUE

Creature Feature - The Spotted Predatory Katydid (<i>Chlorobalius leucoviridis</i>).....	4
Life history notes on the Pale Ciliate-blue, <i>Anthene lycaenoides</i>	6
Invertebrates and Philately	9
New Distribution Records for Polyommatus Butterflies (Lepidoptera: Lycaenidae) in Australia	12
Raising Monarch (<i>Danaus plexippus</i>) Caterpillars.....	21
The Scent of Spitfires	26
Book Reviews - The AgGuide, A practical handbook, Australian Native Bees	30
Moths of Victoria Vol 6 & 7	31
Report - Daisy Hill Forest Field Trip – 3rd December, 2016.....	32
In the Garden	37
BOIC Programme	39



The Spotted Predatory Katydid (*Chlorobalius leucoviridis*) – Martyn Robinson

A number of us can speak other languages. This is not so unusual. There are also some of us who can imitate various animal sounds to the extent where we can get a response from the animal in question. Once again, not so unusual considering our vocal abilities and our adaptability to different situations. What is unusual is when a tettigoniid does this sort of thing too, with several different species, and for decidedly predatory reasons!



The Spotted Predatory Katydid (*Chlorobalius leucoviridis*) male

The Spotted Predatory Katydid (*Chlorobalius leucoviridis*) is - as its common name suggests - a predaceous species which feeds on a variety of other foliage dwelling invertebrates such as caterpillars, spiders, other katydids, grasshoppers and cicadas. They detect most of these prey animals by using their long antennae to locate it, judge the distance and then spring onto it enveloping it in the first two pairs of spiky legs while retaining a grip on the foliage with the rear jumping legs.

The prey is then bitten into immobility, usually behind the neck, and consumed. Like many members of its family the males of this species also 'sing' to attract females, and when adult these long-winged insects can fly readily to new trees and bushes in response to mates, food, or danger. As a result they are quite widespread in inland Australia.

So far nothing too far out of the expected, but then in 2005 the cicada researchers David C. Marshall and Kathy B. R. Hill were observing the males of the cicada *Kobonga oxleyi* which is a species which calls as it flies, and where, in response to the male call, the female cicadas answer at the right point in the male's song, with a wing flick to indicate receptiveness. In two of the cases observed by the researchers the males were heard to get the appropriate 'wing flick' sound from adults of the Spotted Predatory Katydid. Further studies revealed that the wing flick imitations by the katydids were very similar in both sound and timing to those of



real female cicadas. As the sound of the wing flick response in the katydid was produced by the stridulatory mechanism while that of the female cicada was produced by a wing flick, the katydids were adding a little jerk of their body as they respond - presumably to give a visual and/or vibrational feel to the mimicked answer. It was soon demonstrated that as the fooled male cicadas approached the katydids they were caught and consumed. It was noted that female katydids also responded to the cicada calls - although not as consistently as some of the males - and they possess the same stridulatory mechanism (although the females have not been observed to sing like the males). Also there seemed to be a grade of response within the males, with some responding to the cicada calls most of the time while others rarely did so. In addition it was also discovered that this response was seemingly restricted to cicadas of the cicada tribe Cicadettini but interestingly the katydids could correctly respond at the right moment in the male cicada's song to species in this tribe that it would never encounter in the wild - including several New Zealand species. Talk about understanding other languages!

Finally this is an unusual acoustic form of aggressive mimicry (where one species send false signals to another target species which benefits it, usually to the detriment of the target species). Most examples are visual like the worm-like lure of the anglerfishes, and the false response flashes of *Photinus* fireflies, or olfactory mimics like the orchids which mimic the odour of female wasps so the males pollinate the flowers by trying to mate with them. Acoustic mimicry seems far less common and, in this case, is performed in daylight hours only. This makes sense as the prey is diurnal so the mimicked response should be as well, but curiously the katydids will produce their own song day and night. So all this was uncovered by a chance observation by two researchers studying another species and then following up on their observations. *Chlorobalius leucoviridis* may not be the only katydid species to indulge in this behaviour. Who knows what other fascinating behaviours or life history details are still awaiting discovery?

For more information including videos of this behaviour in action go to:-
<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0004185>

Photos David Rentz



Life history notes on the Pale Ciliate-blue, *Anthene lycaenoides* (C. Felder, 1860) Lepidoptera: Lycaenidae - Wesley Jenkinson



The Pale Ciliate-blue has been recorded from the top end of Western Australia, Northern Territory and sporadically from north-eastern Queensland southwards to Cannonvale (near Airlie Beach) central coastal Queensland (in Braby, 2000). It is chiefly known from coastal, sub-coastal regions and sections of the Great Dividing Range. In recent years it has been recorded from several locations in south-eastern Queensland, including two locations near Pomona and Cooroy during January 2015 (R. Mayo, 2015).

Further specimens were raised on *Senna gaudichaudii* at West End, Brisbane (A. Pasieczny, 2015). Both Ross Kendall and John Moss have had them in their gardens at Indooroopilly (2015) and Capalaba (2016) respectively and also feeding on *S. gaudichaudii*. Also recently, I have sighted four females in Beaudesert, two on 24/12/2015 and two on the 7/01/2017. In 2015 I observed one of the females ovipositing on a cultivated *Albizia lebbeck* in my garden, however it is unknown if the larvae survived on this tree. At this stage I have not observed any males. Mayo also reported females only. In northern-eastern Queensland the species is usually less common than the Dark Ciliate-blue (*A. seltuttus*).

I have collected the species in monsoon forest near Weipa and savannah woodland in northern Queensland. The species has been reported as common in [North Qld] suburban gardens (Valentine 1979, 1988, in Braby 2000).

The adults are rapid fliers and can be observed flying around the larval host plants.

Wingspans for the pictured males are 25mm and 24mm for the females.



Anthene lycaenoides (Pale Ciliate-blue)

Images left to right: male, female, male underside, female underside



A range of host plants in the families Caesalpiniaceae, Euphorbiaceae, Fabaceae, Flagellariaceae, Mimosaceae, Verbenaceae and Sapindaceae are listed by various authors in Braby 2000.



The larvae feed on the flower buds and flowers of the host plants.

During January 2017, a female was observed ovipositing on flower buds on a Golden Rain Tree (*Cassia fistula*) in my garden. She typically flew rapidly throughout the host tree branches and settled in sheltered

positions. She then walked around for a short period and curled her abdomen around the base of flower buds laying eggs singly. The wings were closed during ovipositing. After several eggs were laid the female was captured and kept in captivity with some flower sections of the host plant. She laid 19 eggs the following day and she was released the next day. Ovipositing was observed during early afternoon in hot sunny conditions. These eggs were raised in captivity.



The tiny eggs were white, mandarin shaped with deep round shaped pits, approximately 0.3mm high x 0.5mm wide.

Freshly laid egg of *A. lycaenoides*



1st instar larva



2nd instar larva



3rd instar larva



4th instar larva



5th instar larva



5th instar larva



5th instar larva



Pre-pupa



Larvae raised in captivity consumed the top half of eggshell or most of shell after emergence. The camouflaged larvae rested and fed on fresh flower buds of the host plant. The main feeding period appeared to be from dawn throughout the day and dusk with limited feeding during the night. The larvae produced silk threads which were spun around the base of the flower buds as a ‘safety mechanism’ to stop them falling to the ground. Various colour forms (as pictured) of the final instars occurred with the same host plant and conditions.

Larvae completed five instars and attained a length of 14mm. In natural conditions the larvae are often attended by ants (Eastwood and Fraser 1999, in Braby 2000.) In captivity the larvae were successfully raised without attendant ants.



Pupa dorsal view



Pupa lateral view

Pupae, measuring up to 12mm length, were mainly located below a leaf of the host plant on a silk pad. They were attached with silk by the cremaster and a central girdle. In natural conditions pupae have been recorded on the upperside of leaves of the host plant (Braby 2000).

The total time from egg to the first adult was almost 3 weeks, with egg duration of 3 days, larval duration 11 days and pupal duration of 6 days. The final adult emerged 4 days after the first. Adults were observed emerging between 5.30am and 10.00am.

Within the boundary of the new Scenic Rim Regional Shire south of Brisbane I have adult female records for December 2015 and January 2017. There are records for all months of the year for the adults (in Braby, 2000). It may be possible the species is now permanently established in south-eastern Queensland, particularly in frost free zones. Perhaps the adults have small dispersals from these zones into suitable areas during the summer months, particularly when *C. fistula* is flowering. It is possible the species has arrived via the transport of plants from northern Queensland. Alternatively



their presence may reflect natural southward movement due to warmer climatic conditions.

Acknowledgements: I would like to thank John Moss for commenting on the manuscript.

Photos Wesley Jenkinson

References:

Braby, M.F., 2000. *Butterflies of Australia – Their Identification, Biology and Distribution*. Vol 2. CSIRO Publishing.

Pasieczny, A., 2015. Pale Ciliated Blue (*Anthene lycaenoides*). *Metamorphosis Australia – Magazine of the Butterfly & Other Invertebrates Club*. Issue 79: 37-38.

Mayo, R., 2015. Interesting new locations for *Anthene lycaenoides godeffroyi* (Semper) in southern Queensland. *Entomological Society of Queensland News Bulletin* Volume 42 Issue 10: 189.

Invertebrates and Philately – Alan Hyman

The instinct to collect seems to be encoded within our genetic makeup. Few of us would not have made a collection of some kind – however briefly or haphazardly – at some point in our lives. Coins, cereal cards, antiques, rare maps, sporting memorabilia – all have their individual fascination. Stamps of course have been an all-time favourite and those interested in nature perhaps made an accumulation of shells or butterflies. Except for educational purposes, research or scientific purposes, ethical considerations now temper the taking of natural history specimens in the wild purely as an acquisitive hobby – but there are viable alternatives. Photography is one obvious solution. Another is ‘Thematic Philately’, the collecting of specific subject matter as depicted on postage stamps and related material. This can be quite a flexible process, allowing the individual to collect broad categories or to focus on a restricted field. If one chose ‘invertebrates’ as the subject matter, this could be for example, ‘insects of the world’ on one hand or ‘butterflies of the South Pacific’ on the other.

British stamps invariably exhibit a high degree of design elegance and on the 11th July 2013, the Royal Mail issued a set of ten British butterfly stamps, painted by well-known wildlife artist Richard Lewington. (Royal Mail) Head of Stamp Strategy, Philip Parker said: “Every year Royal Mail issues stamps on a wildlife theme and often highlights the plights of threatened species. British butterflies were therefore a natural subject and, unusually for stamps, not much larger than a postage stamp itself”. Many smaller nations have relied on attractive philatelic designs on many subjects for sale to collectors as a source of revenue – and insects, particularly butterflies, have often featured prominently as a theme. Australia has also issued a surprising number of stamps depicting invertebrates, the most recent being in 2016 with a set of four butterflies (Lepidoptera) in May followed by a set of four Jewel



Beetles (Coleoptera – Buprestidae) in September. The following paragraphs highlight a definitive set issued more than thirty years ago.

The first major Australian invertebrate issue was the 1983 set of ten butterfly stamps (as Australian Animals Series III). They were illustrated by Gippsland artist, naturalist and explorer Charles McCubbin, grandson of the famous Heidelberg School impressionist artist Frederick McCubbin, (whose paintings incidentally, ‘On the Wallaby Track’ and ‘Petit Dejeuner’, themselves appeared on stamps in 1981 and 1989 respectively). Anyone fortunate enough to own a copy of Charles McCubbin’s 1971 large format book ‘Australian Butterflies’ will know and appreciate the superb watercolour illustrations (accompanied by his own text) of 330 and 357 then known Australian species as living insects, generally depicted with their native food plants or within the context of their natural or man-made environment. Occasionally a further touch of realism was added by taking the odd chip out of a wing! The eloquent foreword was written by none other than Sir Robert Menzies. (In my view, the closest 21st century equivalent book in style to McCubbin’s is the excellent 2010 Orr and Kitching publication, ‘The Butterflies of Australia’.)

The commissioning of McCubbin ensured a high illustrative quality and technical accuracy. All five Australian butterfly families were represented on the stamps although unequally – four Papilionidae, two Nymphalidae, two Lycaenidae and one each of Pieridae and Hesperiidae. The species illustrated appear to have been carefully selected, given the limited number of stamps in the set and their dual purpose as universal postal products and the desire to produce colourful and attractive collectors’ items for the philatelic market. ‘Maxicards’ (postcards) featuring enlarged images of butterflies, first day (of issue) covers and a stamp pack were also produced. The stamps (with one exception) were issued on the 15th June 1983 and are reproduced below. They are listed in ascending order of value with the common names as they appear on the stamps. (The Linnean names were given on the maxicards.)

- 4 cents Regent Skipper (*Euschemon rafflesia*)
- 10 cents Cairns Birdwing (*Ornithoptera euphorion*)
- 20 cents Macleay’s Swallowtail (*Graphium macleayanus*)
- 27 cents Ulysses Swallowtail (*Papilio ulysses*)
- 30 cents Chlorinda Hairstreak (*Pseudalmenus chlorinda*)*
- 35 cents Blue Tiger (*Tirumala hamata*)
- 45 cents Big Greasy (*Cressida cressida*)
- 60 cents Wood White (*Delias aganippe*)
- 80 cents Amaryllis Azure (*Ogyris amaryllis*)
- 1 dollar Sword-grass Brown (*Tisiphone abeona*)



Australia 4c



REGENT SKIPPER

Australia 10c



CAIRNS BIRDWING

Australia 20c



MACLEAY'S SWALLOW TAIL

Australia 27c



ULYSSES

Australia 30c



CHLORINDA HAIRSTREAK

Australia 35c



BLUE TIGER

Australia 45c



BIG GREASY

Australia 60c



WOOD WHITE

Australia 80c



AMARYLLIS AZURE

Australia \$1



SWORD-GRASS BROWN

Designer: Charles McCubbin;
© Australian Postal Corporation 1983



Comments on the stamp issue:

- *The 30 cent value (*P. chlorinda*)* replaced the 27 cent value (*P. ulysses*) on the 24th October following a price increase of the standard letter rate.
- *The Ulysses has been depicted on three other Australian stamps as part of sets released in 1998, 2003 and 2004.
- *The 60 cent Wood White image was adopted as the logo for the South Australian Butterfly Conservation organization.
- *Interestingly, the Sword-grass Brown variety chosen for the one dollar stamps appears to be *morrisi* rather than the typical *abeona* subspecies.

This is an ideal set with which to commence an ‘Australian’ butterfly collection. It should be noted however, that, wherever their origin most stamps would tend to depict the more attractive or spectacular species of a country to catch the eye of the philatelist and maximize sales.

Stamps, like butterflies, are unfortunately also under threat although from quite a different quarter. As email and texts have become the standard means of communication, so personal letter writing has declined and consequently the use of postage stamps. It would be a sad day if stamps ceased to be issued as they are often exquisite examples of miniature art, as well as being ambassadors for a country, portraying images of a nation’s history, industry, politics, wildlife and many aspects of its culture. Perhaps aesthetic designs could be applied to those style-lacking postage labels now in common use, giving philately a new impetus – maybe even including images of **butterflies and other invertebrates!**

Opinions expressed in this article are those of the author.

We are grateful to the Philatelic Archives, Collector Services, Australia Post for providing us with high resolution images of the stamps depicted.

References:

Butterfly Conservation UK, ‘Butterfly’ Issue 113 / Summer 2013
McCubbin, Charles, 1971 ‘Australian Butterflies’, Thomas Nelson Publishers
Personal Stamp Collection

New Distribution Records for Polyommata Butterflies (Lepidoptera: Lycaenidae) in Australia, including biological notes. Part I – *Zizeeria* and *Famegana* – Kelvyn L. Dunn

Summary

This paper lists 17 new locations in northeastern Australia for *Zizeeria karsandra* (Moore 1865) and *Famegana alsulus* (Herrich-Schäffer, 1869), two species from the subfamily Polyommatainae. Notes associated with particular records provide insight into the behaviour and biology of each species.



Introduction

The Spotted Grass-blue, *Zizeeria karsandra*, and the Black-spotted Grass-blue, *Famegana alsulus*, are two common butterflies that occur in inland areas of northern Australia. These and other lycaenids that inhabit the herb-layer are often patchy in occurrence, which reduces their odds of encounter by random searching – a factor that has affected the knowledge of their distributions nationwide, especially in outback regions where survey has been sparse over the last century (Dunn & Dunn 2006). An experienced eye will help recognise potential haunts where males of these and other polyommataine butterflies patrol with regularity, and knowledge of the larval food plants, about which adults often congregate or inspect, will enhance the probability of encounters with these and similar-looking species. The use of field wisdom and ecological knowledge in conjunction with random searching where larval hosts or flowering trees are conspicuous will help find less obvious species during snapshot surveys and, in process, enable recognition of more fauna at each site visited with less reliance on serendipity. The southern Gulf Country, a region this paper covers in part, remains a frontier that few have investigated entomologically until very recently (Braby 2015). The surveys during the late dry season (when the roads are open to traffic) in 2011 and 2012 explored a large part of western Queensland, including parts of the Gulf Country, using a systematic approach. In the past, entomological enthusiasts (particularly butterfly collectors, who often target certain species-group at the expense of widespread fauna), have sampled irregularly and opportunistically rather than methodically, habitually leaving much of the fauna undocumented in process (Dunn 2009). Their efforts have been valuable and have built much of the baseline knowledge but a systematic approach provides more information and is to be encouraged. The current series of papers have documented much of the findings for the two spring seasons involved; the first paper in the series (Dunn 2013) provided a map of the sites surveyed in western Queensland.

Methods

I utilised a roadside explorative approach that involved close inspections of polyommataine butterflies at numerous sites along major inland highways and byroads on the trips involved. Survey at each site normally involved directional transect-walking, which helped locate adults on the wing. Both sampling and visual data gathering served to underpin the identification of the adults encountered. I often retained vouchers (where permissible) to strengthen diagnoses for some species as the group can be challenging to identify under field conditions. This safety net reduces the potential for errors of commission: which would be, in this case, the reporting of species' presence in areas where they may not or do not occur based on misinterpreted evidence. The vouchers obtained (which are in the author's collection) also serve to support the spatial newness of these records, particularly given the remoteness of the sites from other locations where the butterflies occur. In those few cases where I identified polyommataine butterflies by observation-only, these were done at close range whilst the adults were perching or feeding at flowers, at which times their wings



are held reasonably still and can usually been seen clearly. Those observations where ambiguity in detecting fine wing patterns occurred are given lower category ratings; ‘C2’, being almost certain and ‘C3’, being very probable identifications (see also Dunn 2015, 2016 for discussion). The approach used to measure distance and to define locations with clarity (reducing the chance of ambiguities in process) has been described previously (see Dunn 2016 and relevant references therein).

Results

The table lists records of *Zizeeria karsandra* (Fig. 1) and *Famegana alsulus* (Fig. 2) from 17 new locations (arranged from north to south) across northern and eastern Australia. All sites fall outside (or if not, then very close to) the boundaries defined or inferred by Braby (2000) for the species concerned and so are new on that criterion (see Discussion). Most sites received just one visit; of those tabled, however, a site east of the Cloncurry post office received five inspections across two days (two in the morning, one at noon, and one in the afternoon) recording only three adults of the target species in total. Those repeated inspections in the township stand as convenience-sampling events – exceptional rather than a routine procedure – as the drainage site was walking distance from where I was staying at the time and was inspected whilst doing other activities. A superscript indicates that field notes offer additional insight into particular records, including biological details where recorded. These may include references to encounters by other workers in the last decade or so, where their published new locations fall close to those listed in this report. Some may be augmented by one or more historic references where deemed informative. The spelling of scientific names aligns with Braby (2000) as that was the main source used for this distribution-focused study. Times given are in Australian Eastern Standard Time (AEST).

Table: New locations for two polyommattine butterflies from beyond their known ranges in inland northeastern Australia

Species/Location	State	Geocode	Date	Format
<i>Zizeeria karsandra</i>				
Cloncurry River crossing on bypass road, 3km NNW of Cloncurry	Qld	20°41'S, 140°30'E	22 Oct 2012	Voucher ^{Note 1}
Cloncurry River Anabanch crossing, 1 km W of Cloncurry	Qld	20°42'S, 140°30'E	22 Oct 2012	Obs
About 1 km E of Cloncurry, at drainage area/creek overflow	Qld	20°42'S, 140°31'E	16 Oct 2012 17 Oct 2012	Obs ^{Note 2} Rel. ^{Note 2a}
Corella Creek crossing, 47 km E of Julia Creek	Qld	20°40'S, 142°11'E	26 Oct 2012	Voucher



St George, Balonne R., nth end of Church St, near showground	Qld	28°02'S, 148°35'E	16 Nov 2011	Voucher
Barwon River crossing, 1.6 km N of Brewarrina	NSW	29°57'S, 146°52'E	15 Dec 2013	Voucher
Bogan River crossing, 1.3 km NW by W of Nyngan	NSW	31°33'S, 147°11'E	16 Dec 2013	Voucher
<i>Famegana alsulus</i>				
4 km NE by N of Gregory Downs	Qld	18°37'S, 139°16'E	10 Oct 2012	Obs ^{Note 3}
Gregory River crossing, 0.5km NW of Gregory Downs	Qld	18°39'S, 139°15'E	11 Oct 2012	Voucher
Lawn Hill Nat Park, on 'Island Stack'	Qld	18°42'S, 138°29'E	24 Oct 2012	Obs ^{Note 4}
Lawn Hill Nat Park, at 18°43'04"S 138°28'59"E.	Qld	18°43'S, 138°29'E	24 Oct 2012	Obs ^{Note 5}
130 km by road SE of Burke & Wills Roadhouse	Qld	19°59'S, 141°06'E	26 Oct 2012	Voucher
Terry Smith Lookout, 80 km NNW of Cloncurry	Qld	20°05'S, 140°14'E	16 Oct 2012	Voucher
About 1 km E of Cloncurry, at drainage area/creek overflow	Qld	20°42'S, 140°31'E	17 Oct 2012	Voucher ^{Note 6}
Richmond (Harris Street, in residential garden)	Qld	20°44'S, 143°08'E	30 Oct 2011	Voucher
Duck Creek, 5 km (beeline) N of Malbon	Qld	21°02'S, 140°18'E	17 Oct 2012	Voucher
Malbon River crossing, 1.7 km WNW of Malbon	Qld	21°04'S, 140°17'E	17 Oct 2012	Voucher ^{Note 7}

Key to Table:

Note 1. A male of *Z. karsandra* was observed flying about and settling on the yellow flowers of *Cajanus pubescens* (Fabaceae). This legume was growing in melaleuca riparian forest at the river crossing, within rivergum grassy woodland – it is a known host plant for *F. alsulus* (the following species in this report) but not *Z. karsandra*. In this case, the butterfly was almost certainly feeding at the flowers. I was unable to get close enough to see if the proboscis was extended for several seconds (as accepted criterion) because of the insect's small size, so I secured it in the event that it might depart unidentified rendering void the new spatial record it represents. It was the only one of this species seen during the inspection time between 1200 and



1235 h. Common and Waterhouse (1981: 585) commented concerning its larvae, that they “are said to feed also on the pea-like flowers of legumes...” but listed no genera nor gave a source for this information. Braby (2016) did not list any members of the plant family Fabaceae as larval hosts of this butterfly in Australia. The legume patch about which the adult focussed probably served as a place for mate location linked to a potential foraging area – a known behaviour of most butterflies – one that adults likely sourced for nectar at other times of the day.

Note 2. A male *Z. karsandra* was seen in open woodland flying about Caltrop (*Tribulus* sp.; Zygophyllaceae) – a known larval host plant of this species – during late morning at 1100 h. An inspection earlier that same day, between 0900 and 0930 h did not result in sightings of this species despite looking for 30 minutes during suitable weather. **Note 2a.** Two females were present the following day (during 2.5 hours survey time); one was seen in the morning (between 0850 and 1045 h), none was seen at noon, and a female was seen again in mid-afternoon (between 1410 and 1430 h). I inspected the final female in hand to confirm her identification and to underpin the earlier sight records. Adults were uncommon and were found only by searching around the host plants. These plants were localised in the area and particularly common on a vacant house block nearby. *Z. karsandra* probably occurs widely in sparse, low growing vegetation along waterways in the Cloncurry district. The abundance of adults would vary both seasonally and locally – the species is not usually hard to find.

Note 3. A male of *Famegana alsulus* was recognised whilst perched during mid-afternoon (at 1410 h) on foliage of yellow flowering Rattlepods (*Crotalaria* sp. probably *novae-hollandiae*; Fabaceae) – a plant growing prolifically along the road shoulder on route to Burkettown. The adult did not feed at the flowers during several minutes spent watching it. *Crotalaria* is not a known larval host of this butterfly (Braby 2016) so it may have served as a place for mate location linked to a potential foraging area, likely sourced for nectar at other times of the day. Nonetheless, *Crotalaria* may be utilised occasionally as a larval host, albeit unrecorded at this time, as the larvae feed on other members of this plant family (Braby 2016). (Rattlepod was sporadic and widespread along road shoulders in various places in the southern Gulf Country. The plant looked very similar to *Crotalaria novae-hollandiae*, one species identified with certainty growing profusely along the roadside elsewhere in the region.)

Note 4. A few males of *F. alsulus* were seen roosting on foliage, and occasionally patrolling the flowers of a *Tephrosia remotiflora* (Fabaceae) in spinifex-shrubland, at 210 m a.s.l., on that platform elevated above the river system. None was seen to feed during ten minutes observation during late afternoon



(between 1720 and 1730 h), perhaps because of the late hour of the day in the tropics, at which time – at least during spring – butterfly activity usually declines quickly (see also commentary by Van der Poorten and Van der Poorten (2016) for tropical species in Sri Lanka). *Tephrosia* is not a known larval host of this butterfly (Braby 2016) so it may have served as a place for mate location linked to a potential foraging area, likely sourced for nectar at other times of the day. Notwithstanding this, the larvae feed on members of this plant family so *Tephrosia* may be utilised as a larval host, albeit unrecorded at this time.

Daniels and Edwards (1998) earlier recorded *F. alsulus* from Lawn Hill National Park and the contiguous Musselbrook Reserve in the southern ‘Gulf Country’, during May 1995 – distribution omitted from the range-fill map by Braby (2000); hence, my report stands as supplementary temporal data (rather than filling a range gap). Franklin (2007), who surveyed in the Main Gorge area of Lawn Hill National Park during July 2006, did not record this species but did so at four sites remotely to the north during that same month, providing evidence of a broad distribution in the region, and adding to temporal knowledge. The revised map by Braby (2016) now includes the southern region of the Gulf of Carpentaria. The earlier inventory for the park by Daniels and Edwards (1998), as well as later surveys in the greater region by Franklin (2007), and more recently, survey at the eastern extremity in the Normanton district by Braby (2015), underpin the recent extension to its range.

Note 5. A single unsexed adult of *F. alsulus* was glimpsed feeding during mid-afternoon (at 1540 h) at a flower of *Tephrosia remotiflora* (Fabaceae) in shrubby woodland along a walking trail to the Upper Gorge Lookout, at 174m a.s.l. It immediately departed the area on my close approach to inspect its underwing patterns. A focus on this site for five minutes, which included repeated inspections of other flowering *Tephrosia* plants growing in the vicinity, revealed no other feeding butterflies of this or other species. I feel confident it was *F. alsulus* although its underwing patterns were not seen closely. I would have liked another second or two to check those details, as field-based identifications can be difficult because of the close similarity of many low flying species and due to the butterfly’s small size (requiring one’s close approach where trapping devices are not permitted). *Candalides erinus* was the only other similarly sized butterfly on the wing in the park during the visit (from 0830 to 1240 h), and it was not that species; its flight, colour tone on the upper-side, and the less pointy forewings distinguished it. *F. alsulus* was locally common about *Tephrosia* elsewhere in the National park (see Note 4) so I felt sure it was another of that same species rather than a different species (meaning, one left unrecorded on my survey of over four



hours). This location, as with the one above from the same reserve, is now a boundary record (Braby 2016) – see commentary in Note 4.

Note 6. I inspected this moist terrain, which appeared to be a creek overflow or area of flood drainage, in the township of Cloncurry on three occasions at different times of the day on the 17th (see Note 2a). A single female of *F. alsulus* was collected between 1410 and 1430 h. No adults of *F. alsulus* were detected during earlier visits between 0850 - 1045 h and at noon; nor were any seen on a visit the previous day (16th) at 1100 h. The low abundance of butterflies locally made this and other species hard to find and so increased the time needed to list the ‘common’ species active that month in the township. Moreover, it was already getting late in the season by October (as day temperature continue to rise steadily during mid spring, increasingly at or above 35°C) and butterfly numbers were progressively declining. Indeed, a visit on the 2nd of November (albeit, the previous year) had recorded just one species flying in the township – that being a widespread migratory butterfly – namely *Catopsilia pomona* (Fabricius 1775); this pierid remains active during the hotter months in the inland towns of northeastern Australia (where its larvae feed on exotic garden ornamentals). I recorded only ten species across several visits to Cloncurry from mid to late October 2012; each survey generally yielded species not seen on previous visits and that evidence suggests that a larger fauna in the residential area is to be anticipated. Although I have not visited Cloncurry during summer, I should imagine that butterflies would be hard to find in absence of plants in blossom, once the high temperatures that prevail in outback northern Australia set in.

Note 7. T. Woodger (credited by Braby 2000) recorded *F. alsulus* in the Selwyn Range – a landform situated 69 km beeline S by E of Malbon; the population was found at the Mt Dora Mine at 21°40’S, 140°30’E (T. Woodger pers. comm. 2012). Although mentioned in the text, the location was not included on the range-fill map in that work, and this omission has carried through to the field guide by Braby (2016). The inland range-fill spot in western central Queensland, which one might suppose is that site by comparison with the text, is a degree of latitude south of the Selwyn Range. It aligns with a record from Limestone creek, at 42 km NNW of Boulia (22°35’S 139°43’E), which was not listed in that text but which was plotted by Dunn and Dunn (1991), the source used by Braby (2000: xix) as a baseline to synoptically map the species’ distributions. That record from near Boulia is supported by a specimen in the ANIC collected by I.F.B. Common and M.S. Upton in 1973, and their site (clarified by a GPS on the specimen’s label) lies 129 km SW by S of the Selwyn Range location, and would be the site mapped by Braby (2000, 2016).



Discussion

The new records presented add insight into the spatial and temporal distribution of *Z. karsandra* and *F. alsulus*. They provide ongoing evidence that there remains much to learn about the spatial distribution of small and inconspicuous butterflies across the continent, particularly in outback regions of northern Australia. Each location falls either beyond or near the boundaries of each species' distribution as based on the range-fill maps by Braby (2000) in consultation with the revised maps by Braby (2016) and other published evidence. Whether these locations are unique extensions far afield, or whether they provide secondary support for outlier regions (and so strengthen boundaries constructed from sparse data), either way, each fills a knowledge gap both spatially and temporally. Importantly, the updated maps for these two species provided by Braby (2016) remain (for the most part) unchanged in these parts of eastern Australia suggesting that no further spatial knowledge from the inland has come to hand.

An inadequate knowledge of species' distributions in these inland regions of the continent would likely explain all of these new distribution records, given that there has been a lack of regular exploration by insect collectors, both spatially and across seasons in the outback and other remote regions of the continent (Dunn & Dunn 2006). None of the records listed would appear to link into range changes associated with unusual seasonal events or longer-term climate changes. The wetter-than-usual seasons that took place in eastern Australia during 2010-2012 (which had prompted the trips) would have enhanced species' abundance at many inland sites making adults more noticeable where present. In contrast, during seasons of below average (or even average) rainfall and, particularly when associated with unseasonably hot weather, adult butterflies would be infrequently seen. Sampling under these more usual conditions would result in comparatively lower species counts, with fewer new records anticipated.

Acknowledgements

I thank Terry Woodger, then of Richmond, Qld, for information on his collecting sites in the Selwyn Range. Tony Bean kindly identified the *Cajanus* species, a probable nectar source for one of the species listed; the late Russell Best had facilitated that identification by proxy. John Prince (Ranger at Lawn Hill National Park) identified the *Tephrosia* species during my photographic survey of the park's butterfly fauna. He enthusiastically pointed out and named various flowering plants close to the ranger station to assist butterfly recording in the park (as nectar sources are important to attract species otherwise hard to find in arid areas). He also identified some plants in the area known to be larval hosts of some of the resident butterflies. Finally, John T. Moss (Capalaba, Qld.) offered helpful suggestions to improve the manuscript in places.



References

Braby, M.F. 2000. *Butterflies of Australia: their identification, biology and distribution.* CSIRO Publishing, Collingwood Vic.

Braby, M.F. 2015. New distribution records for some butterflies from the Gulf of Carpentaria, northern Queensland. *Northern Territory Naturalist* 26: 67-75.

Braby, M.F. 2016. *The Complete Field Guide to Butterflies of Australia.* second edition. CSIRO Publishing, Clayton South, Vic.

Common, I.F.B. & Waterhouse, D.F. 1981. *Butterflies of Australia.* Second Edition. Angus & Robertson, Melbourne, Vic.

Daniels, G. & Edwards, E.D. 1998. Butterflies from Lawn Hill National Park and Musselbrook Reserve, Queensland. In Comben, I., Long, S. & Berg, K. (eds.). *Musselbrook Reserve Scientific Study Report* (pp.89-91). The Royal Geographic Society of Queensland, Brisbane.

Dunn, K.L. 2009. Overview of the butterfly database: Part 2 – Current composition, imbalances and factors of influence. *Victorian Entomologist* 39(5): 89-100.

Dunn, K.L. 2013. Field Notes: Major extensions to the known distribution of the Bright Purple Azure, *Ogyris barnardi* (Miskin 1890) in Queensland (Lepidoptera: Lycaenidae). *Metamorphosis Australia, Magazine of the Butterfly & Other Invertebrates Club* 68: 26-32.

Dunn, K.L. 2015. New distribution records for Coeliadine and Trapezitine butterflies (Lepidoptera: Hesperiidae) in Australia. *Metamorphosis Australia, Magazine of the Butterfly & Other Invertebrates Club* 79: 13-31.

Dunn, K.L. 2016. New distribution records for thecline butterflies (Lepidoptera: Lycaenidae) in Australia. Part I – *Jalmenus*, *Hypochrysops*, *Hypolycaena* and *Rapala*. *Metamorphosis Australia, Magazine of the Butterfly & Other Invertebrates Club* 81: 21-34 & corrigendum 82: 30.

Dunn, K.L. & Dunn, L.E. 2006. *Review of Australian butterflies – 1991. Annotated Version.* (CD-ROM). Melbourne, Australia: Published by the authors.

Franklin, D.C. 2007. Dry season observations of butterflies in the ‘Gulf country’ of the Northern Territory and far north-west Queensland. *Northern Territory Naturalist* 19: 9-14.

Van der Poorten, G.M. & Van der Poorten, N.E. 2016. *The Butterfly Fauna of Sri Lanka.* Lepodon Books, Canada.



Fig. 1



Fig. 2



Fig. 1. *Z. karsandra* under side – Mamukala Wetlands, about 31 km (by road) W of Jabiru, NT, 05 June 2008; one of many seen near the birdhide feeding at flowers amongst low herbage between 1210 -1310 h (AEST).

Fig. 2. *F. alsulus* male under side – Mamukala Wetlands, NT, 05 June 2008, perched on seed head amongst low herbage along the walking trail to the birdhide.

Photos by Kelvyn Dunn

Raising Monarch (*Danaus plexippus*) Caterpillars – Paul Klicin

For each BOIC magazine issue I plan to write an article that features a different species of butterfly and information about my own personal experience in raising these particular caterpillars. While I am no expert in the field of Lepidoptera I am hoping my own personal experiences will inspire others interested in raising caterpillars to butterflies.

I have a 6 year old daughter and I have, for the last couple of years, got a huge thrill out of teaching her about nature and the life cycle of butterflies. It's fun to watch caterpillars eat and grow and you get a sense of accomplishment when finally a butterfly emerges from its chrysalis and you get to release it into nature. Meanwhile, there is a lot to learn along the way.



Monarch distribution within Australia

Source: Braby. The Complete Field Guide to Butterflies of Australia

I have personally found some caterpillars more difficult to raise than others and sometimes you just get lucky or unlucky. Obviously depending on what part of the world you come from will depend on what butterflies you will encounter in your particular area.

I am starting off with the Monarch butterfly as I believe it is relatively easy for anyone starting out. You have probably seen this butterfly as it is often found visiting suburban gardens. It is quite a common and widespread butterfly and one that I believe is a great way for beginners starting out.

As a kid I grew up in the country in northern New South Wales just outside of Lismore. We called this butterfly a Wanderer, however it is more commonly called a Monarch which is not to be confused with the Lesser Wanderer.

We had plenty of wild cotton bushes growing throughout our farm so it was natural that we would come across the Monarch caterpillars. Once you are able to readily identify this host plant they are easy to find growing alongside roads and paddocks in not only rural areas but often your local suburb or park. Some wild cotton or



milkweed plants have round seed pods or long narrow seed pods (*Gomphocarpus physocarpus* and *Asclepias curassavica*). You can either dig up and pot them so you have a constant supply of fresh caterpillar food or you can grow your own from seed which is very easy to do. If you are unable to find this plant I am sure someone would be willing to send you some seeds. Once the plant is established butterflies will soon find your plant.

I recommend growing your own, if you have the patience, as introducing potted plants may be introducing diseased or parasitic affected plants. Interestingly enough I have rarely experienced parasites amongst healthy looking plants. Recently I had a shortage of plants as my seedlings were not mature enough to sustain the caterpillars I had, so I dug up some local plants and put the potted plants within an enclosure. The result was disastrous as I lost over 50% of the caterpillars while they were in their chrysalises. Often caterpillars in the wild have eggs laid on them by the tachnid fly. If you look closely you can sometimes see one or more tiny white eggs stuck to the caterpillar. Forget about trying to remove them. In my situation I suspect that eggs from parasites had been laid on the mature plant's leaves then ingested by the caterpillar as all of my caterpillars were brought in while either at egg stage or only a couple of days old and still very tiny. Previous to this I have had an almost 100% success rate raising caterpillars from eggs in captivity and feeding them on fresh leaves and good healthy looking live plants.



Three varieties of Milkweed I grew from seed.

Above *Gomphocarpus physocarpus*
Left above and below *Asclepias curassavica*





Early in 2016 I collected between 50-60 eggs off host plants found in a local park. I carefully pinned the leaves to prevent them curling up once the leaves began to dry out.



The eggs don't take long to hatch and under warm and humid conditions the caterpillars grow quickly.



Monarch caterpillars are easy to raise on cut leaf as long as it is fresh.

As the caterpillars grow they will obviously eat more and excrete more so it is important to clean out your enclosure regularly. I learned this the hard way as I missed a day or two of cleaning out my enclosure and due to it being overcrowded in the first place and not clean the caterpillars caught a virus. The first sign of

this was that the caterpillars stopped eating and growing. You will notice this as suddenly the caterpillars don't seem to be growing as quickly they would normally. Ultimately I lost over 90% of my caterpillars. Under the right conditions it is quite surprising how quickly healthy caterpillars will grow. If you are only raising a dozen



or so this should not be a big issue for you. I just happened to go a bit over the top and raised a lot and learned the hard way. I had to start all over again and next time raised even more (approximately 80) with an almost 100% success rate. This was more due to the fact that after about a week I transferred the early instar caterpillars onto healthy live potted plants. This way I was able to leave them to their own devices and all the caterpillar frass just dropped to the floor or ground of the enclosure. If there is a shortage of food or they eat all the leaves before you have a chance to top up their supply I have seen these caterpillars eat fresh plant stem and also the plant's flower. They have quite the appetite!



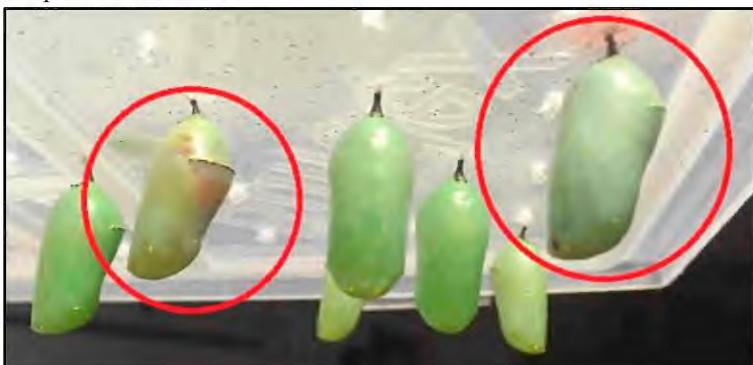
Although collecting caterpillars from the wild can be fun if you find some host plants, it can be a hit and miss affair as quite often these caterpillars have already been parasitised and basically a dead caterpillar walking. They have no chance of becoming a butterfly. I have personally found that on average at least 50% of wild caught caterpillars have already been infected. It can be heart breaking for the beginner, but that is nature. The same can often be said about plants that are dug up from the wild and potted so make sure your plants are young and healthy looking. Under the right conditions these

caterpillars grow very quickly and will consume a lot of food and will easily strip a plant of leaves, so if you have a lot of small caterpillars you had better have a lot of food ready for them.





When ready to pupate, caterpillars will sometimes do so on other plants or almost anything they feel like (including furniture) and will often travel a fair distance in doing so if not kept in an enclosure.



2-3 of these chrysalises have been infected with parasites. Once this is established it is better to remove them and destroy them.



Healthy chrysalises (You can see the wings on the butterfly already forming.)





A Monarch butterfly showing its colours and about to emerge very soon.



When things go right you can end up with a butterfly explosion. At one stage I was releasing about 8 butterflies per day for over a week. I had a very happy daughter.

If you have more questions please go to:

<https://www.facebook.com/butterfliesandcaterpillars/>
or: <https://www.facebook.com/groups/187619097411/>

Next Issue: Raising Common Crow caterpillars with some surprising results.

References

Braby, M. 2016. *The complete field guide to butterflies of Australia*. Second Edition. CSIRO Publishing.

Jordan, F. and Schwencke, H., 2005. *Create More Butterflies. A guide to 48 butterflies and their host-plants for South-east Queensland and Northern New South Wales*. Earthling Enterprises.

Photos Paul Klicin

The Scent of Spittfires – Densey Clyne

It is during a day trip to the Blue Mountains west of Sydney that I notice a female *Perga affinis* doing something interesting on a gum leaf. Sawflies have always been favourites of mine though it is mostly their caterpillar-like larvae I'm familiar with. However, I am able to identify this female, whose larvae are common around Sydney's suburban streets and gardens where eucalyptus trees have survived.





A cluster of Spittfires (*Perga affinis*)



Extruding defensive oil



On the move

The blackish larvae, commonly known as spittfires, are easy to see by day clustered among the blue-green leaves. At night they play follow-my-leader to a fresh lot of gum-leaf food. How the leader is chosen and how it knows where to go is a mystery though there has been some research on the subject. As they move along they tap-tap-tap their tails on the branch, a signal to keep them together. When a single larva does get lost it taps urgently and

the rest respond quickly so the lost one can hasten to catch up with its siblings.

Some people find spittfires repulsive to look at. They are also reputed to be poisonous, but not so. The name Spittfire is itself a misnomer - they raise their heads and ooze rather than spit. The yellow goo that comes out of their mouths when they're disturbed is simply concentrated oil of eucalyptus, pleasant-smelling to us (try it!) but obviously a deterrent to their predators. They will also lift their tails and ooze a similar fluid when threatened. Their habit of clustering as an amorphous blackish ball must be a



source of puzzlement to enemies; it could quite possibly be a predator itself. The word 'sawfly' is also partly wrong; these are not flies but ancient precursors of wasps and bees. Unlike their relatives adult sawflies are not social insects, so it is quite surprising that they have gregarious offspring. Importantly sawflies don't have a sting and I might be forgiven for saying that thereby hangs a saw...



Newly moulted Spitfire (*Perga affinis*)

adult behaviour. She isn't bothered by my presence and I am fairly sure she's preparing the leaf for egg-laying. This is exciting - I decide to curtail my mountain walk and spend the rest of the day watching her.

What strikes me first is the change the sawfly is making to the appearance of the gum leaf. Already about two thirds of the surface, an area extending either side of the midrib, looks rougher and a shade

Moulted spitfires within a group can often be seen by day, soft, yellow-coloured individuals dangling freely from the packed cluster. I must say I find something appealing about a vulnerable young sawfly hanging high above the ground held - literally - by peer pressure. Is this concern by its fellows deliberate or simply fortuitous? When all the spitfires in a group have finished growing they go to ground, dig down into the soil and make themselves an amazing communal cocoon out of silk threads. Each larva has its own chamber with small annexe above into which it apparently stores its cast skin. There they pupate, and inside the tough, well-insulated cocoon they may remain underground for several years before the winged adults emerge.

Well, up to the time I meet with my female *P. affinis* that's more or less what I had learned over the years about spitfires. Now was my chance to learn from this female something about their



Egg-laying



lighter than the rest. She continues moving about and now I can see that she's scraping the surface of the leaf with a kind of rasp or file on the end of her abdomen. Why? I can only guess that this will make it easier for the larvae to push their way out after hatching.

After a while the female stops close to the leaf's midrib. Now I can see for myself how these insects got their name. The female has produced a long, saw-edged ovipositor, not a weapon but an efficient tool. She inserts it confidently between the delicate layers of leaf tissue, underneath the midrib and across to its opposite side. She is making a slit or cavity in which to lay her eggs. And I see something quite unexpected. As the saw goes in and out a ribbon of green material is extruded, presumably the spoil from her sawing. As she extends the slit I assume she is laying her eggs one after another inside it. .

All this has taken time and I can't stop for the finish but must hurry home to Sydney. I leave *Perga affinis* to it, with thanks for a most enlightening chance encounter.

Footnote: My story about the spitfire sawfly is not quite finished so I turn to a related species to continue it. *Pseudoperga lewisii* is a small sawfly that also feeds in the gum trees around Sydney. The visible evidence of this female's egg-laying is a long blister on the surface of the leaf close to the midrib. Once this is completed, the female stays on the leaf to warn predators away from the eggs and later from the hatchlings. I've seen this protective behaviour in several other sawfly species, and even heard a warning "zzzt!" from some of them. But does *P. affinis* display such after-care for her offspring? I leave it to another sawfly enthusiast to find out and complete the story for me.



P. affinis scraping the leaf surface



Pseudoperga lewisii with egg blister



Pseudoperga lewisii guarding larvae

Photos Densey Clyne



BOOK REVIEWS

The AgGuide, A practical handbook, Australian Native Bees



is 174 pages long with colour photographs or plates throughout. It has been published by the NSW Department of Primary Industries and produced by Tocal College, Education Delivery – Reviewed by *Martyn Robinson*

What a great book! The Australian Native Bees AgGuide (A practical handbook) will probably become known as the Native Bee Bible if it hasn't already acquired that name. It is recommended to people with an interest in insects, bees, food production, ecosystems and food-webs, biodiversity, gardens and the like!

It has an excellent line up of Australian bee expert authors collaborating on the various chapters so you know the information will be reliable. This

information is backed up by particularly nice, clear images of native bees taken by both these authors, and various other photographers.

The chapters cover, in detail, the topics of bee biology and behaviour, bees as pollinators, agricultural beescapes, native bees for pollination services in agriculture, urban bee ecology, creating artificial nest sites for Australian solitary and semi social bees, bee identification, stingless bees, capturing, photographing and classifying bees, and bee biosecurity. So from that you can see that it will have something of interest for a wide range of readers be they farmers, land rehabilitators, bush regenerators, home gardeners, city and suburban dwellers wanting to preserve what wildlife they can in their area, naturalists, school teachers and environmental educators, botanists and plant biologists - the list goes on!

The book provides practical methods of providing or preserving native bee habitat and why this is so important. For those wanting to get the most out of their stingless bees it provides details on how to manage and propagate the hives for pollination services and honey production, as well as just having a 'pet hive' of them in the garden.

The one thing this book is NOT is a field guide, simply because the number of bee species in Australia is so large with new species being discovered each year. Also different species are common in each state and capital city, so a field guide alone would be - by necessity - a much larger book, and probably become out of date quite rapidly as new species are discovered and named. Nevertheless even the identification aspect has been covered to some extent by providing the means to identify the insect in question down to family level and often to genus level with the features clearly



shown or described. It also shows the several ways to identify bees from other similar ‘lookalike’ insects using photographs to highlight the features.

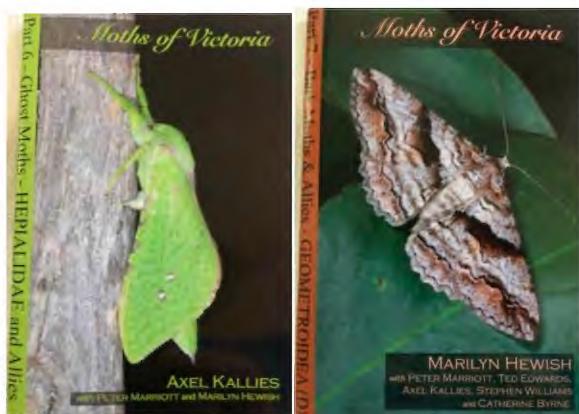
The pollination section is very interesting and lists some of the other useful non-bee pollinators as well as the best (and worse) bee species to do the job and on which types of crops. There is information here about the potential for using *Amegilla* and *Xylocopa* bee species for greenhouse pollination instead of the exotic bumblebees there has been a push for in more recent times.

The section on biosecurity details the currently known introduced bee species in Australia and their potential threat - as well as some of the more alarming potential threats from other accidental introductions - like Varroa mite, and the one that has already happened - the Small Hive Beetle!

As can be expected from the relatively new increase in interest in native bee ecology and management, some of the practical advice is of the ‘this has worked for some people - try it and see’ type, while other sections are more detailed and tested over time. This is where the readers themselves can contribute to future editions if they happen to discover some new facet of native bee behaviour or biology.

The book is available from Tocal College – Phone 02 4939 8888 or 1800 025520 – Email tocal.college@dpi.nsw.gov.au - Internet tocal.nsw.edu.au

Moths of Victoria Vol. 6 & 7 – Reviewed by Peter Hendry



which also occurs in QLD, NSW, NT and WA.

They are authored by the team at the Entomological Society of Victoria, volume 6 headed by Axel Kallies along with Peter Marriott and Marilyn Hewish. Volume 7 is headed by Marilyn Hewish along with Peter Marriott, Ted Edwards, Axel Kallies, Stephen Williams and Catherine Byrne.



As with previous volumes, volume 6 and 7 consist of a booklet containing spread images of all the species dealt with, along with images of live moths and some larvae. Each booklet contains a CD. The CD for volume 6 contains over 150 additional pages in pdf format, while the CD for volume 7 contains over 250 additional pages.

Within the Hepialidae many species can be hard to separate from one another, in particular the genus *Oxycanus*. To this end the CD for volume 6 contains close up images of the antennae and comparison of the differing length, between species, of the rami (branch) is given. A further aid is provided in the form of Norman Tindale's original illustrations of the male pseudotegumen (part of the genitalia that can be seen at the base of the abdomen). These illustrations are offset with close up images of the structure which really helps in understanding them.

The volume 7 CD contains up to 7 pages on the one species, in some cases the full life cycle is shown. There are handy hints on how to separate some species and many variations of the same species are shown. It was interesting to see that of the 4 species of *Cleora* identified as existing in Victoria, no existing names could be confidently assigned. So I feel not alone with this difficult genus.

Though primarily aimed at Victoria many of these moths occur in other parts of Australia. I am sure anyone who owns a copy of the previous volumes would not want to miss these two and for anyone with a passing interest in the moth lepidoptera I cannot recommend these volumes highly enough.

An order form can be obtained from the Entomological Society of Victoria website, http://entsocvic.org.au/?page_id=52 and emailed to vicmoth@entsocvic.org.au

REPORTS

Daisy Hill Forest Field Trip – 3rd December, 2016 – *Paul Klicin* –

Field Trip Co-ordinator

Thanks to everyone that attended the BOIC field trip to Daisy Hill State Forest.

It was disappointing to see that numbers were way down on this trip and as a regular visitor to this particular location I knew what to expect and I knew whoever attended would not be disappointed due to the sheer diversity of butterflies and other Invertebrates here. If you are reading this and you were not there, here is what you missed out on.

At 10am we all set off and were no more than five metres from where we parked our cars when we located a multitude of Glasswing caterpillars feeding on one their host plants which was the wild passion vine (*Passiflora aurentia*).





Meanwhile newly emerged Glasswings hovered and glided about close by. I figured a quick scan amongst the blady grass below would reveal Glasswing chrysalises. Only 2-3 weeks previous much of the *Passiflora aurentia* vine was covered with hungry feeding Glasswing caterpillars of various instars. It was quite surprising to see so many openly feeding in the middle of the day. They did not appear to be hiding from predators and due to their numbers, perhaps were more concerned with competing with each other for food. I found quite a few chrysalises hidden amongst the blady grass and I could tell by the colour of some of them that butterflies would emerge soon.

After observing and photographing the Glasswings we continued on and after only a few more steps we came across two Evening Brown caterpillars feeding on blady grass (*Imperata cylindrical*). The Evening Brown is a favourite of mine and who can resist these fascinating critters with their two little horns.





Growing at the edge of the walking track were some young Camphor Laurel trees (*Cinnamomum camphora*). A quick scan of the fresh growth revealed some Blue Triangle butterfly eggs and early instar caterpillars.

We then walked no more than twenty metres when we spotted a female Purple Crow butterfly laying eggs on a Burny Vine (*Trophis (Malaysia) scandens*). I had never previously seen a Purple Crow at this location so this was new to me and a great bonus to see on this field trip. Capturing a photograph of this butterfly proved fruitless despite numerous determined attempts. Even after witnessing the eggs being laid they were still very difficult to find, however the photo below shows we were eventually successful.



Purple Crow larva and adult – Photos Ross Kendall www.boic.org.au

Only five metres away from the Burny Vine we found a sole Sandpaper Fig (*Ficus coronata*) growing. Host plant for the Purple Moonbeam butterfly, I had previously never been able to locate the caterpillar, however the tell-tale chew marks made by recently feeding caterpillars told me my luck was about to change. Three Purple Moonbeam caterpillars were spotted almost immediately resting on the underside of a leaf. As you can see they camouflage quite well. Another first for me and I must admit I am a big fan of these peculiar furry looking caterpillars. Since then I have found numerous Sandpaper Fig trees throughout the area growing close to creek banks.





A personal observation I made with the 3 Purple Moonbeam caterpillars is that when they were at rest they remained quite flat to the leaf and when on the move they were more raised and fatter as opposed to being quite flat when at rest. I found them to be quite mobile and get along quite swiftly when they want to while also having the ability to blend in extremely well with the fig leaf.



On the same Sandpaper Fig (pictured right) we also found these caterpillars which we have been unable to identify. Can anyone identify them?

Some other interesting and colourful insects encountered at this location.



This Katydid is commonly known as the 'Swayer' (*Austrophlugis malidupa*).



Despite attempts to have this insect identified, this very colourful and interesting looking bug that we spotted remains unidentified at the time of printing this article.





Lantern Bug (*Desudaba psittacus*)



Fungus-eating Ladybird (*Illeis galbula*)



A rather tattered looking Love Flower (*Pseuderanthemum variabile*) and one of the host plants to the Leaf Wing butterfly. The colours of the flowers of the Love Flower may vary from white, pink and lavender.

A list of butterflies that I have positively identified in this location of Daisy Hill State Forest

1. Common Crow (Common here)
2. Blue Tiger (rarely seen here)
3. Meadow Argus (Common here)
4. Blue Triangle (Common here)
5. Painted Lady
6. Evening Brown (Common here)
7. Glass Wing (Common here)

8. Caper White
9. Brown Ringlet (Common here)
10. Varied Eggfly (rarely seen here)
11. Monarch (Common here)
12. Leaf wing (Common here)
13. Scarlet Jezebel
14. Caper Gull
15. Orchard Swallowtail (Common here)
16. Purple Moonbeam (Larva) (rarely seen here)

17. Small Grass Yellow (rarely seen here)
18. Purple Crow (rarely seen here)
19. Pearl White
20. Albatross



Some Host Plants in this area

Love Flower (*Pseuderanthemum variabile*) – Leaf Wing and Varied Eggfly
Blady Grass (*Imperata cylindrical*) – Evening Brown
Wild Passion Vine (*Passiflora aurantia* and *Passiflora suberosa*) – Glass Wing
Camphor Laurel (*Cinnamomum camphora*)(Exotic) – Blue Triangle
Caper Tree (*Capparis spinosa*) – Caper White
Milk Weeds (*Gomphocarpus physocarpus* and *Asclepias curassavica*) (Exotic) – Monarch
Monkey Rope Vine (*Parsonia straminea*) – Common Crow
Sandpaper Fig (*Ficus coronata*) – Purple Moonbeam

I hope to see you on the next bush walk/field trip and meanwhile, happy bug hunting

Photos Paul Klicin

References:

Jordan, F. & Schwencke, H. (2005) Create More Butterflies
Moss, J.T. (2002) Butterfly Host Plants of South-east Queensland and Northern New South Wales, Third Edition.
<http://www.boic.org.au/index.html?page=/html/home.htm>

IN THE GARDEN

Louise Sorensen



On our property at Clarence Town, NSW, the native slender grape vine *Cayratia clematidea* is a very important food source for the caterpillar of the beautiful Joseph's Coat Moth - *Agarista agricola*. The caterpillar feeds exclusively on this plant in my garden although we also have two cultivated grape vines. *Cayratia clematidea* is readily spread by birds and can become a nuisance if not culled.





The orange instar wanders around the garden seemingly looking for a suitable place to pupate. On one occasion I followed one for an hour as it climbed up and down the lower part of eucalypt trunks but I tired before the caterpillar did. On two other occasions I observed one disappearing between the brickwork and the door frame. As its habit is to chew wood for its pupa, I do hope it is not chewing the wood around my door! Nevertheless it is a most welcome visitor and although I see it frequently, I seldom see the beautiful moth itself.

Also observed eating the Cayratia vine is the pale hawk moth – *Theretra latreille*.

Photos Louise Sorensen

Jill Fechner happened to pass this little slice of life happening on a wisteria bloom. Lean Lynx spider (*Oxyopes macilemus*) doing the eating and female Large Purple Line-blue (*Nacaduba berenice*) being the eaten.
Photo Jill Fechner

The Australian Museum (Sydney) is celebrating 190 years and is releasing a collection of 22 botanical / butterfly high quality giclee prints as a limited edition. Expensive, but there are other less costly associated products available as well. The illustrations were painted by the Scott sisters in the 19th century and are exquisite. Anyhow, it is worth checking out at: thestore.com.au/australianmuseum



BUTTERFLY AND OTHER INVERTEBRATES CLUB PROGRAMME

BOIC Annual General Meeting

When: Saturday 1st April, 2017 starting at 10 am

Following the AGM, Erica Siegel will speak on *The World of Australia's Solitary Native Bees*

Where: Redlands IndigiScapes Centre, 17 Runnymede Road, Capalaba

If you wish to partake of a luncheon at the Centre's Café following the meeting, you will need to book by phoning 3824 8611.

Butterfly Walk at the property of Brisbane Girls Grammar School

What: This will be to look at the past planting of many host trees and the establishment of vines for the Richmond Birdwing on the property which is bordered by a creek.

When: Sunday 9th April, 2017. Meet at 9am

Where: Brisbane Girls Grammar School, Sprenger Street, Fig Tree Pocket.

Please note that Sprenger Street comes off Fig Tree Pocket Road but it does a right hand turn as the straight ahead road becomes Terrigal Street.

Who: All members and friends welcome

Contact: Keith Treschman ph. 38562262

Planning and General Meeting followed by a guided walk.

What: Our quarterly planning meetings are informative and interesting and we welcome members to contribute to discussion. This meeting will be followed by a guided walk (led by John Moss) through the 39 hectare Charles S. Snow Environmental Reserve where a very large number of butterfly host plants were established approximately 10 years ago.

When: Saturday 13th May, 2017 meeting from 10 am and walk from 11.30 am

Where: Meet at the Mungara Scout Hall at the corner of Cleveland/Redland Bay Road and Colburn Avenue, Victoria Point. Entry to the car park is on the left immediately **before** crossing Colburn Avenue.
(If lost, phone John on 0427 596 753)

What to bring: Enthusiasm is welcome. Tea, coffee and biscuits will be provided

A walk in South D'Aguilar National Park

When: Saturday 3rd June, 2017. Meet at 10am

Where: Pitta Circuit - South D'Aguilar National Park

How to get there: Drive 17km west along Mount Nebo Road from Walkabout Creek, The Gap (20 minutes from central Brisbane via Waterworks Road)

The Walk: 1km return (20-30 minutes) excludes stopping for talks and photos and exploring etc.) Uneven gravel surface but mostly stroller friendly.

Amenities: Toilets, picnic tables. Cafés in nearby Mount Nebo township

What you may expect to see: Pademelons, land mullets, butterflies, bugs, satin bowerbirds and other birds.

www.tripadvisor.com.au rates this walk 4 out of 5 stars.



DISCLAIMER

The magazine seeks to be as scientifically accurate as possible but the views, opinions and observations expressed are those of the authors. The magazine is a platform for people, both amateur and professional, to express their views and observations about invertebrates. These are not necessarily those of the BOIC. The manuscripts are submitted for comment to entomologists or people working in the area of the topic being discussed. If inaccuracies have inadvertently occurred and are brought to our attention we will seek to correct them in future editions. The Editor reserves the right to refuse to print any matter which is unsuitable, inappropriate or objectionable and to make nomenclature changes as appropriate.

ACKNOWLEDGMENTS

Producing this magazine is done with the efforts of:

- Those members who have sent in letters and articles
- David Rentz who provided the cover image
- Daphne Bowden who works on layout, production and distribution
- David Rentz, John Moss and Ross Kendall for scientific referencing and proof reading of various articles in this issue of the magazine

ARE YOU A MEMBER?

Please check your mailing label for the date your membership is due for renewal. If your membership is due, please renew as soon as possible. **Membership fees are \$30.00 for individuals, schools and organizations.** If you wish to pay electronically, the following information will assist you: BSB: **484-799**, Account No: **001227191**, Account name: **BOIC**, Bank: **Suncorp**, Reference: your membership number and surname e.g. **234 Roberts**.

Butterfly and Other Invertebrates Club Inc.
PO Box 2113
RUNCORN Q. 4113

Next event: BOIC Annual General Meeting - Saturday 1st April, 2017 starting at 10 am – See Programme for details.

